

REMARKS

This Response is offered in reply to the Office Action of December 31, 2001.

In paragraph 3 of the office action, claims 1-10 are rejected under 35 USC 103(a) as obvious in view of Miller US Patent 4 093 017 taken with Japan document 3-97675.

Applicants respectfully disagree with this rejection. Applicants have amended their claims to recite a method of treating a ceramic core after molding and before firing for use in casting molten metallic material wherein an unfired ceramic core having a molded core shape and having an organic binder is placed on at least one setter, the setter and the unfired ceramic core thereon are placed on a conveyor that conveys them through a heating oven, and the setter and unfired ceramic core are conveyed through the heating oven to heat the setter and the unfired ceramic core to an elevated superambient temperature effective to soften the organic binder to reduce distortion of the unfired ceramic core.

✓ With respect to the Section 103 rejection, Applicants would first point the examiner to column 1, lines 23-27 of the Miller patent where Miller describes the prior art molding of a refractory core composition and then firing the green core at a temperature of 1000 to 1300 degrees C. The examiner will note that the patent does not disclose any step whatsoever after molding and before firing of the green (unfired) core, much less treatment steps of the type recited in Applicants' pending claims to reduce distortion of the unfired, molded core before firing. The examiner himself acknowledges this deficiency of the Miller patent on page 2, last paragraph of the office action.

Applicants would also point the examiner to the disclosure of the Miller patent that describes adding a mineralizer to a silica core composition to beneficially affect conversion of vitreous silica to cristobalite during firing of the core to impart thermal stability thereto at directional solidification casting temperatures of 1550 to 1650 degrees C or higher for one hour or more.

The Miller patent discloses at column 4, lines 30-34 firing the green mineralizer-modified silica core at 1000 to 1400 degrees C for a period of time sufficient to provide 40% to 55% by weight of cristobalite and then cooling to a temperature below 100 degrees C. The examiner again will note that that portion of the patent does not disclose or suggest any step whatsoever after molding and before firing of the green (unfired) core, much less treatment steps of the type recited in Applicants' pending claims to reduce distortion of the unfired, molded core before firing.

In the detailed description of the Miller patent, column 13, lines 24-40 describe firing the green silica core at 500 to 600 degrees C to remove organic compounds such as any organic binder present (column 13, lines 27-28) followed by firing at 1000 to 1400 degrees C to obtain a desired amount of cristobalite (column 13, lines 28-32) for imparting thermal stability at mold casting temperatures of 1550 to 1600 degrees C or higher for one hour or more. The examiner again will note that detailed description of the Miller patent does not disclose or suggest treatment steps of the type recited in Applicants' pending claims to reduce distortion of the unfired, molded core before firing.

This contrasts to Applicants' claimed invention wherein, in combination with other steps set forth, the setter and unfired ceramic core are conveyed through the heating oven to heat the setter and the unfired ceramic core to an elevated superambient temperature effective to soften the organic binder to reduce distortion of the unfired ceramic core. Applicants' specification describes, for purposes of illustrating and not limiting the invention, conveying an unfired (green), molded ceramic core having a specific organic thermosetting GE resin binder between setters through a heating oven to heat the setter and the unfired ceramic core to a target temperature of about 300 degrees F (149 degrees C) to soften the specific GE resin binder (e.g. see page 8, first paragraph). Again, the Miller patent does not disclose or suggest such a core treatment after molding and before firing.

The examiner acknowledges at the top of page 3 of the office action that the Miller patent does not disclose placing a ceramic core on a setter and conveying the core through an oven to heat the core to a superambient temperature. The examiner cites the Japanese document as showing a conveyor carrying a setter with a core thereon through an oven to fire the core.

However, Applicants would point out that claims 1-10 recite treatment steps that are conducted on an unfired (green) ceramic core; i.e. before firing of the ceramic core, contrary to the Japanese document and the examiner's description of its teachings.

The Japanese document does not relate to treating of a ceramic core after molding and before firing for use in casting molten metallic material as recited in pending claim 1. Instead, the Japanese document involves high temperature sintering through firing of ferrite cores in oxygen-containing gas to produce high permeability cores as expressly described in the translation of the abstract provided by the examiner. A temperature of 1350 degrees C

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appears on page 455, right hand column, line 8 of the untranslated Japan document.

The Japanese document is not believed to make up for the above-noted gross deficiencies of the Miller patent since the document teaches high temperature sintering through firing of ferrite cores in an oxygen-containing gas of a tunnel furnace. Neither the Miller patent nor the Japanese document discloses or suggests treatment steps of the type recited in Applicants' pending claims to reduce distortion of an unfired (green) ceramic core after molding and before firing or sintering. The combination of the Miller patent and the Japanese document is not believed correct, and even if made is not believed to even remotely suggest Applicants' claims 1-10. Reconsideration of the Section 103 rejection of claims 1-10 is requested.

Applicants respectfully request allowance of pending claims 1-10.

Respectfully submitted,



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CERTIFICATE OF MAILING

I hereby certify that this correspondence and enclosures are being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on March 27, 2002.



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